

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 January 2001 (18.01.2001)

PCT

(10) International Publication Number
WO 01/03981 A1

(51) International Patent Classification⁷: B60R 27/00

(21) International Application Number: PCT/KR00/00741

(22) International Filing Date: 10 July 2000 (10.07.2000)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
1999/27706 9 July 1999 (09.07.1999) KR

(71) Applicant and

(72) Inventor: KIM, Bo-Yean [KR/KR]; No. 101, 299-18,
Yeannam-Dong, Mapo-Ku, Seoul 121-240 (KR).

(81) Designated States (national): AE, AL, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK,
DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,

IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,
RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA,
UG, US, UZ, VN, YU, ZA, ZW.

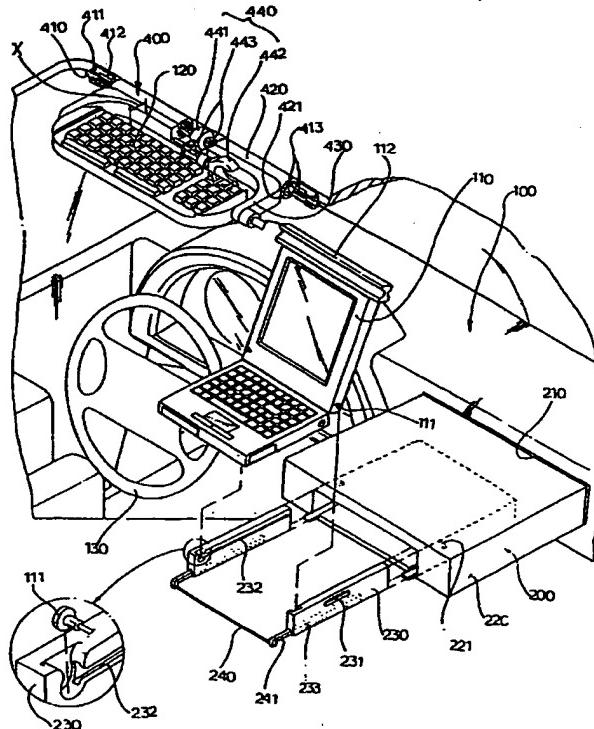
(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: BUSINESS MANAGEMENT SYSTEM OF INDOOR IN VEHICLES



BUSINESS MANAGEMENT SYSTEM OF INDOOR IN VEHICLES

Technical Field

The present invention relates, in general, to a business management system of indoor in vehicles and, more particularly, to an arrangement for mounting and using a notebook computer in an automobile, which allows the notebook computer to be used comfortably in the automobile and accordingly allows the interior of the automobile to be utilized as a convenient office space due to the mounting of the notebook computer in an automobile, permits the notebook computer to be moved to various locations owing to the detachability of the notebook computer from the arrangement, and allows its keyboard to serve as a sun visor because of the multiple uses of the arrangement.

Background Art

In present times, an automobile and a computer are indispensable items to the modern person. The automobile serves as one of principal vehicles, and the computer serves as one of principal data processing apparatuses.

However, since the automobile and the computer are manufactured independently of each other, there is no correlation between the automobile and the computer. As a result, since an automobile is not equipped with a computer, there occurs an inconvenience in which a user must carry the computer in his automobile when he desires to use the computer in the automobile, or there occurs a problem in which he cannot use the computer in the automobile when he forgets to carry the computer in his automobile. In addition, since the automobile is not provided with computer mounting means, the user cannot utilize the computer in the automobile in a stable state.

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide an arrangement for mounting and using a notebook computer in an automobile, which allows the notebook computer to be used comfortably in the automobile and accordingly allows the interior of the automobile to be utilized as a convenient office space due to the mounting of the notebook computer in an automobile, permits the notebook computer to be moved to various locations owing to the detachability of the notebook computer from the arrangement, and allows its keyboard to serve as a sun visor because of the multiple uses of the arrangement.

In order to accomplish the above object, the present invention provides an arrangement for mounting and using a computer in an automobile, comprising: internal mounting means for storing a notebook computer in an instrument panel formed in the front of an automobile and withdrawing the notebook computer from the instrument panel; external mounting means for supporting the internal mounting means outside of the instrument panel and moving the internal mounting means to a desired position; and keyboard mounting means for mounting a keyboard to the steering wheel of the automobile and the inner front portion of the body of the automobile so that a person in the driver's seat operates the notebook computer that is mounted to the instrument panel by the internal and external mounting means and the keyboard is utilized as a sun visor when out of use; wherein the notebook computer that is mounted to the instrument panel by the internal and external mounting means is detachable from the internal and external mounting means.

The internal mounting means may comprise: a mounting cavity longitudinally formed in the instrument panel; a container having a receiving slot and two guide projections on the opposite walls of the receiving slot, the container being fixable in the mounting cavity; two movable frames, each of the movable frames having along its central portion a guide slot for being guided by the guide projections of the container with the guide slots receiving the guide projections, a guide groove along the upper portion of its inner wall and a slide groove along the

lower portion of its inner wall; a support plate for supporting the notebook computer, the support plate having on both sides two slide rails that are inserted into the slide groove of the movable frames; and two wheels and a handle, the wheels being respectively formed on the rear portions of both side surfaces of a monitor part of the notebook computer and being respectively inserted into the guide grooves of the movable frames.

The external mounting means may comprise: a rotating shaft for rotating the container horizontally, the rotating shaft being fixed on the bottom of the container; a horizontal guide bar for guiding the rotating shaft forward and rearward to move the container forward and rearward, the horizontal guide bar having an operating bar at its bottom and being fixed over a lower portion of the rotating shaft; a tilted guide bar for supportably guiding the operating bar to support the container horizontally or in a tilted manner; and a support stand for supporting the container outside of the instrument panel, the support stand being integrated with the tilted guide bar and fixed to the instrument panel.

The keyboard mounting means may comprise: two hooking and engaging members fixed to the interior of the automobile in front of a driver's seat while being spaced apart from each other; a fixing shaft having external longitudinal teeth engaged with the engaging portions of the hooking and engaging members when both ends of the fixing shaft are respectively hooked by the hooking portions of the hooking and engaging members; a rotating cylinder having internal longitudinal teeth fitted around the fixing shaft and slightly engaged with the external longitudinal teeth of the fixing shaft; a connecting frame for holding the keyboard between its two ends, the connecting frame being integrated with the rotating cylinder at the front end of the rotating cylinder; and one or more grip arms for connecting the keyboard to the steering wheel, the holders being formed on a central portion of the rotating cylinder.

Brief Description of the Drawings

The above and other objects, features and other advantages of the present

invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is an exploded perspective view showing a state in which a notebook computer is mounted in an automobile using internal mounting means of the present invention;

Fig. 2 is a perspective view showing a state in which a notebook computer is used on the internal mounting means;

Fig. 3 is a side sectional view showing a state in which a notebook computer is withdrawn to the outside from the internal mounting means;

Fig. 4 is a perspective view showing a state in which a notebook computer is mounted in an automobile using external mounting means of the present invention;

Fig. 5 is an exploded perspective view of the external mounting means in accordance with the present invention;

Fig. 6 is a side view showing a state in which the notebook computer is kept in the external mounting means of the present invention;

Fig. 7 is a side view showing a state in which the notebook computer is situated to be usable on the external mounting means of the present invention;

Fig. 8 is a perspective view of another support stand;

Fig. 9 is a perspective view showing keyboard mounting means of the present invention;

Fig. 10 is a cross section taken along line A-A of Fig. 9;

Fig. 11 is a cross section taken along line B-B of Fig. 9;

Fig. 12 is a cross section showing another shaft engaging mechanism; and

Figs. 13 and 14 are partially sectional front views showing two keyboard mounting means in accordance with two other embodiments of the present invention.

Best Mode for Carrying Out the Invention

A preferred embodiment of the present invention is described with

reference to the accompanying drawings, hereinafter.

Fig. 1 is an exploded perspective view showing a state in which a notebook computer is mounted in an automobile using internal mounting means of the present invention. Fig. 2 is a perspective view showing a state in which a notebook computer is used on the internal mounting means. Fig. 3 is a side sectional view showing a state in which a notebook computer is withdrawn to the outside from the internal mounting means. Fig. 4 is a perspective view showing a state in which a notebook computer is mounted in an automobile using external mounting means of the present invention. Fig. 5 is an exploded perspective view of the external mounting means in accordance with the present invention. Fig. 6 is a side view showing a state in which the notebook computer is kept in the external mounting means of the present invention. Fig. 7 is a side view showing a state in which the notebook computer is situated to be usable on the external mounting means of the present invention. Fig. 8 is a perspective view of another support stand. Fig. 9 is a perspective view showing keyboard mounting means of the present invention. Fig. 10 is a cross section taken along line A-A of Fig. 9. Fig. 11 is a cross section taken along line B-B of Fig. 9. Figs. 12, 13 and 14 are views showing keyboard mounting means in accordance with other embodiments of the present invention.

The present invention provides an arrangement for mounting and using a computer in an automobile, thereby allowing office work to be performed in the automobile. As illustrated in Figs. 1 to 11, the arrangement comprises internal mounting means 200 for storing a notebook computer 110 in an instrument panel 100 formed in the front of an automobile and withdrawing the notebook computer 110 from the instrument panel 100, external mounting means 300 for supporting the internal mounting means outside of the instrument panel 100 and moving the internal mounting means to a desired position, and keyboard mounting means 400 for mounting a keyboard 120 to the steering wheel of the automobile and the front portion of the body of the automobile. The keyboard mounting means 400 allows a driver to operate the notebook computer 110, which is mounted to the instrument panel 100 by the internal and external mounting means 200 and 300, in the driver's

seat, and permits the keyboard 120 to be used as a sun visor when the keyboard 120 is out of use.

In such a case, since the electric connection between the notebook computer 110 and the keyboard 120 and between the notebook computer 110 and an electric source (not shown) are well known, an explanation of the connection is omitted here.

As shown in Figs. 1 to 3, the internal mounting means comprises a mounting cavity 210 longitudinally formed in the instrument panel 100, a container 220 having a receiving slot and two guide projections 221 on the opposite walls of the receiving slot, the container 220 being fixable in the mounting cavity 210, two movable frames 230, each of the movable frames 230 having along its central portion a guide slot 231 for being guided by the guide projections 221 of the container 220 with the guide slots 231 receiving the guide projections 221, a guide groove 232 along the upper portion of its inner wall and a slide groove 233 along the lower portion of its inner wall, a support plate 240 for supporting the notebook computer 110, the support plate 240 having on both sides two slide rails 241 that are inserted into the slide groove 233 of the movable frames 230, and two wheels 111 and a handle 112, the wheels 111 being respectively formed on the rear portions of both side surfaces of the monitor part of the notebook computer 110 and being respectively inserted into the guide grooves 232 of the movable frames 230. The support plate 240, the movable frame 230 and the notebook computer 110 are withdrawn from the container 220 in a multistage manner.

As depicted in Figs. 4 to 7, the external mounting means 300 comprises a rotating shaft 310 for rotating the container 220 horizontally, the rotating shaft 310 being fixed on the bottom of the container 220, a horizontal guide bar 320 for guiding the rotating shaft 310 forward and rearward to move the container 220 forward and rearward, the horizontal guide bar 320 having an operating bar 330 at its bottom and being fixed over the lower end of the rotating shaft 310, a tilted guide bar 340 for supportably guiding the operating bar 330 to support the container 220 horizontally or in a tilted manner, and a support stand 350 for

supporting the container 200 out of the instrument panel 100, the support stand 350 being integrated with the tilted guide bar 340 and fixed to the instrument panel 100.

Although the support stand 350 is depicted as being applied to the instrument panel 100 having a curved surface in the drawings, the support stand 350 may be applied to other types of instrument panels having various surfaces in a case where the instrument panel 100 is divided into two parts connected by a hinge 351 as shown in Fig. 8.

As illustrated in Figs. 1, 2, 4, 9 to 11, the keyboard mounting means 400 comprises two hooking and engaging members 411 and 412 fixed to the interior of the automobile in front of the driver's seat while being spaced apart from each other, a fixing shaft 410 having external longitudinal teeth 413 engaged with the engaging portions 412 of the hooking and engaging members 411 and 412 when both ends of the fixing shaft 410 are respectively hooked by the hooking portions 412 of the hooking and engaging members 411 and 412, a rotating cylinder 420 having internal longitudinal teeth 421 fitted around the fixing shaft 410 and slightly engaged with the external longitudinal teeth 413 of the fixing shaft 410, a connecting frame 430 for holding the keyboard 120 between its two ends, said connecting frame 430 being integrated with the rotating cylinder 420 at the front end of the rotating cylinder 420, and one or more grip arms 440 for securing the keyboard 120 to the steering wheel 130, said grip arms 440 being formed on the central portion of the rotating cylinder 420.

Each of said grip arms 440 comprises a rotating base 441 situated around the central portion of the fixing shaft 410, an arm 443 connected to the rotating base 441 and provided with a joint so as to bend the grip arm 440 toward a desired position, and a grip 442 connected to the grip arm 440 so as to be fixed around the steering wheel 130.

In such a case, in order to fix the keyboard 120 to the steering wheel 130 securely, the number of the grip arms 440 is not necessarily limited to one, but may be two or more.

Additionally, both ends of the fixing shaft 410 are not limited to being

fixed to the hooking and fixing members 411 and 412 in a teeth manner. That is, as shown in Fig. 12, both ends of the fixing shaft 410 may be fixed to the hooking and engaging members 411 and 412 in such a manner that two square projections 410a are formed on both ends of the fixing shaft 410, two square grooves are formed on the engaging portions 412 of the hooking and engaging members 411 and 412 and the square projections 410a and the square grooves are engaged with each other to prevent the fixing shaft 410 from being rotated.

If the technical effect of the external longitudinal teeth 413 of the fixing shaft 410 and the internal longitudinal teeth 421 of the rotating cylinder 420 for rotatably fixing the keyboard 120 is achieved, the rotating cylinder 420 may be formed on both ends of the external longitudinal teeth 413 of the fixing shaft 410 as shown in Fig. 13, or the external longitudinal teeth 413 of the fixing shaft 410 may be formed on both ends of the rotating cylinder 420 as shown in Fig. 14.

The operation of the arrangement according to the present invention is described hereinafter.

The container 220 is fixedly inserted into the mounting cavity 210 formed in the instrument panel 100. The movable frames 230, the support plate 240 and the notebook computer 110 are engaged with the container 220.

When the support plate 240 is pulled to the outside, the slide rails 241 are withdrawn to the outside through the slide grooves 233. After the slide rails 241 are completely withdrawn, the movable frames 230 are withdrawn to a distance equal to the length of each guide slot 231.

At this time, when a user holds the handle 112 and pulls the notebook computer 110, the wheels 111 are withdrawn to the outside through the guide grooves 232. When the wheels 111 are completely withdrawn, the front portion of the notebook computer 110 is situated on the support plate 240 and the rear portion of the notebook computer 110 is supported on the movable frames 230 by the wheels 111.

In such a state, if the monitor part of the notebook computer 110 is opened, the notebook computer 110 can be brought to a usable state. After the notebook computer 110 is used, the notebook computer 110 can be restored into

the container 220 backwards.

In order to remove the keyboard 120, having been used as a sun visor, from the automobile body and fix it to the steering wheel 130, the fixing shaft 410 is removed from the hooking and engaging members 411 and 412 and the grip 442 of the grip arm 440 is forcibly fitted over the steering wheel 130.

In such a state, the user can operate the notebook computer 110 in the driver's seat using the keyboard 120. After the keyboard 120 is used, the keyboard 120 is removed from the steering wheel 130 and the fixing shaft 410 is fixedly inserted into the hooking and engaging members 411 and 412. At this time, the grip arm 440 is bent to be situated in a space X between the keyboard 120 and the connecting frame 430 in such a way that the arm 440 is bent by means of the joint 443 and the rotating base 441 is rotated to allow the arm 440 to face the keyboard 120, so as to prevent the grip arm 440 from interfering with the other parts.

When the connecting frame 430 is rotated downward so as to use the keyboard 120 as a sun visor, only the rotating cylinder 420 is rotated while the fixing shaft 410 is fixed because external longitudinal teeth 413 of the fixing shaft 410 are engaged with the engaging portions 412 of the hooking and engaging members 411 and 412. Since the rotating cylinder 420 is rotated while the internal longitudinal teeth 421 of the rotating cylinder 420 are loosely engaged with the external longitudinal teeth 413 of the fixing shaft 410, the rotating cylinder 420 is stopped and fixed in position if the force exerted on the rotating cylinder 420 is removed.

When the internal mounting means 200 is not installed or a user desires to mount and use the notebook computer 110 on the external mounting means 300, the external mounting means 300 can be employed. As shown in Fig. 6, the external mounting means 330 is fabricated by combining the rotating shaft 310, the horizontal guide bar 320, the operating bar 330, the tilted guide bar 340 and the support stand 350 and the external mounting means 300 is situated beneath the container 220.

When the front portion of the horizontal guide bar 320 is raised up so as to

use the notebook computer 110, the front portion of the operating bar 330 is raised up along the tilted guide bar 340 and the operating bar 330 may be fixed to the tilted guide bar 340 of the support stand 350 at a desired position.

If the monitor part of the notebook computer 110 is opened when the 5 notebook computer 110 is horizontally situated, the notebook computer 110 should be moved toward the user because the monitor part of the notebook computer 110 may collide with the front window of the automobile.

When the container 220 is pulled toward the user, the container 220 is moved forward because the rotating shaft 310 of the external mounting means 300 10 is moved forward along the horizontal guide bar 320. In this state, the container 220 is rotated toward the user using the rotating shaft 310 and the notebook computer 110 is withdrawn in the same way as that of the internal mounting means 200, so that the notebook computer 110 is situated in a usable position.

The notebook computer 110 can be carried to other locations because the 15 notebook computer 110 can be removed from the internal and external mounting means 200 and 300 by removing the wheels 111 of the notebook computer 110 from the guide grooves 232 of the movable frames 230.

Industrial Applicability

As described above, the present invention provides an arrangement that is 20 capable of stably mounting a notebook computer in an automobile, thereby allowing the notebook computer to be used comfortably in the automobile and accordingly allowing the interior of the automobile to be utilized as a convenient office space.

In addition, the arrangement of the present invention allows the notebook 25 computer to be moved to various desired locations owing to the detachability of the notebook computer, and permits its keyboard to serve as a sun visor.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing

from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. An arrangement for mounting and using a computer in an automobile, comprising:

5 internal mounting means for storing a notebook computer in an instrument panel formed in the front of an automobile and withdrawing the notebook computer from the instrument panel;

external mounting means for supporting the internal mounting means outside of the instrument panel and moving the internal mounting means to a desired position; and

10 keyboard mounting means for mounting a keyboard to the steering wheel of the automobile and a inner front portion of a body of the automobile so that a person in a driver's seat operates the notebook computer that is mounted to the instrument panel by the internal and external mounting means and the keyboard is utilized as a sun visor when out of use;

15 wherein the notebook computer that is mounted to the instrument panel by the internal and external mounting means is detachable from the internal and external mounting means.

2. The arrangement according to claim 1, wherein said internal mounting means comprises:

20 a mounting cavity longitudinally formed in the instrument panel;

a container having a receiving slot and two guide projections on opposite walls of the receiving slot, said container being fixable in the mounting cavity;

25 two movable frames, each of the movable frames having along its central portion a guide slot for being guided by the guide projections of the container with the guide slots receiving the guide projections, a guide groove along an upper portion of its inner wall and a slide groove along a lower portion of its inner wall;

a support plate for supporting the notebook computer, said support plate having on both sides two slide rails that are inserted into the slide groove of the movable frames; and

two wheels and a handle, said wheels being respectively formed on rear portions of both side surfaces of a monitor part of the notebook computer and being respectively inserted into the guide grooves of the movable frames.

5 3. The arrangement according to claim 2, wherein said support plate, said movable frame and said notebook computer are withdrawn from said container in a multistage manner.

10 4. The arrangement according to claim 1, wherein said external mounting means comprises:

a rotating shaft for rotating the container horizontally, said rotating shaft being fixed on a bottom of said container;

15 a horizontal guide bar for guiding the rotating shaft forward and rearward to move the container forward and rearward, said horizontal guide bar having an operating bar at its bottom and being fixed over a lower portion of the rotating shaft;

a tilted guide bar for supportably guiding the operating bar to support the container horizontally or in a tilted manner; and

20 a support stand for supporting the container outside of the instrument panel, said support stand being integrated with the tilted guide bar and fixed to the instrument panel.

5 5. The arrangement according to claim 4, wherein said support stand is divided into two parts that are connected by a hinge.

25 6. The arrangement according to claim 1, wherein said keyboard mounting means comprises:

two hooking and engaging members fixed to an interior of the automobile in front of a driver's seat while being spaced apart from each other;

30 a fixing shaft having external longitudinal teeth engaged with the engaging portions of the hooking and engaging members when both ends of the

fixing shaft are respectively hooked by the hooking portions of the hooking and engaging members;

a rotating cylinder having internal longitudinal teeth fitted around the fixing shaft and slightly engaged with the external longitudinal teeth of the fixing
5 shaft;

a connecting frame for holding the keyboard between its two ends, said connecting frame being integrated with the rotating cylinder at a front end of the rotating cylinder; and

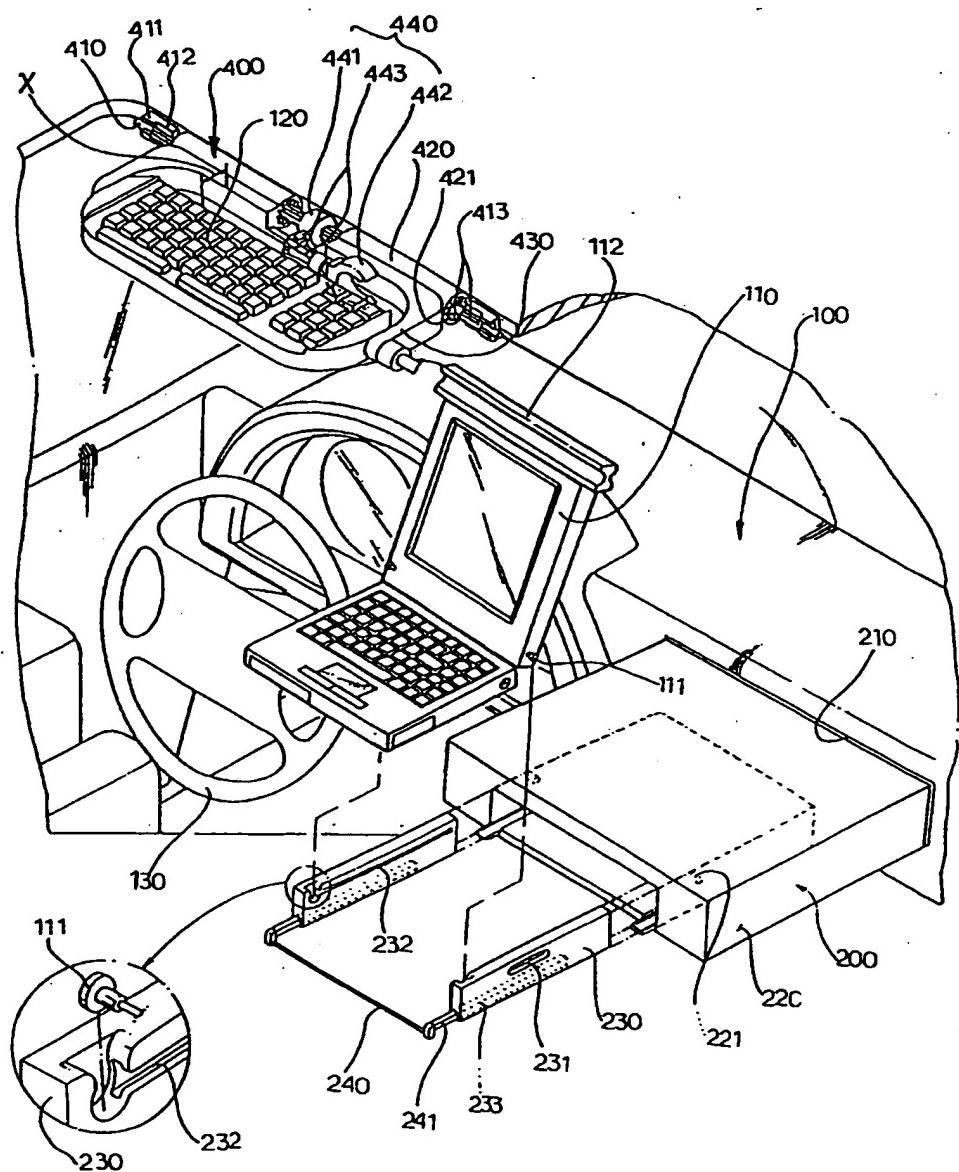
one or more grip arms for connecting the keyboard to the steering wheel,
10 said holders being formed on a central portion of the rotating cylinder.

7. The arrangement according to claim 6, wherein each of said grip arms comprises a rotating base situated around a central portion of the fixing shaft, an arm connected to the rotating base and provided with a joint so as to bend the grip
15 arm toward a desired position, and a grip connected to the grip arm so as to be fixed around the steering wheel.

8. The arrangement according to claim 6, wherein the number of said grip arms is two or more.

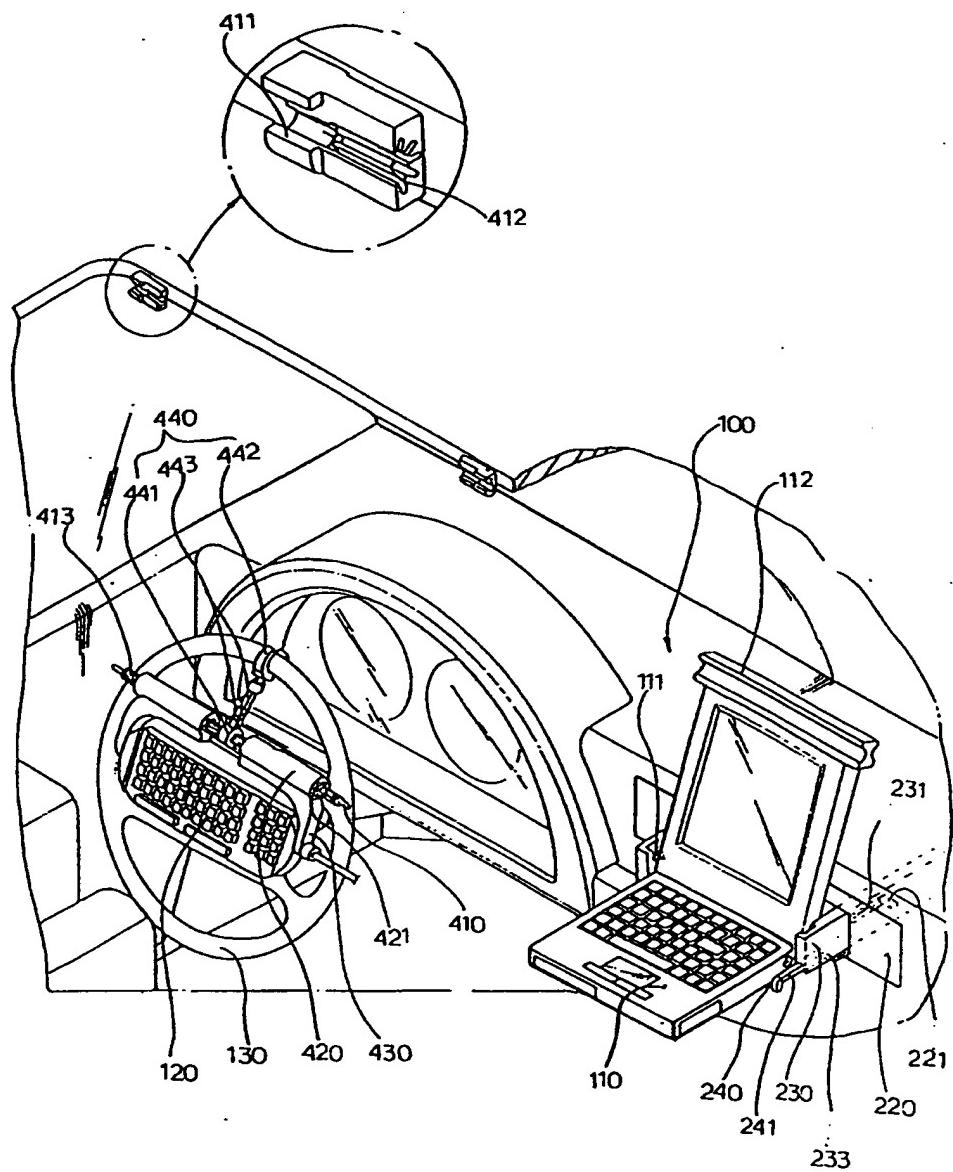
1/11

FIG. 1



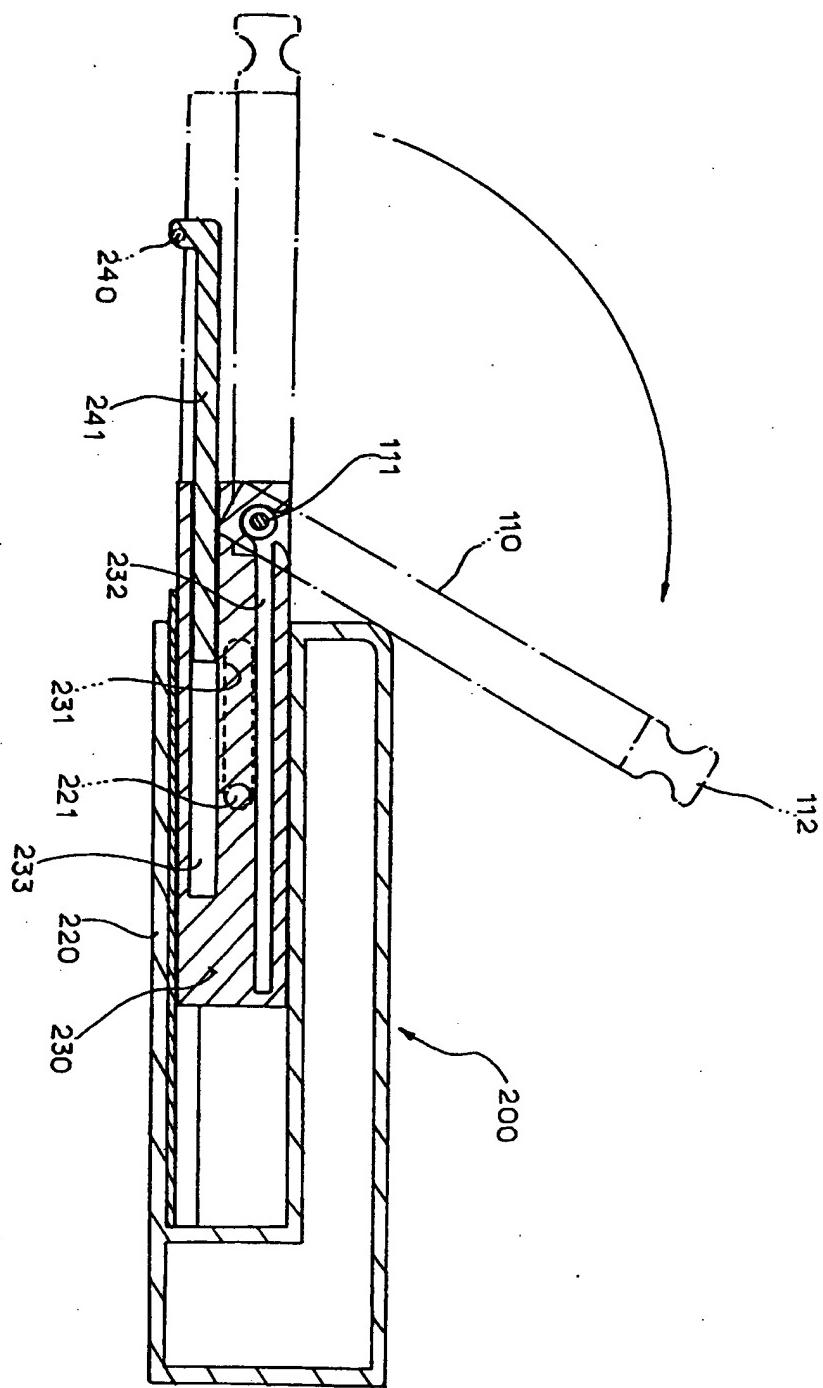
2/11

FIG. 2



3/11

FIG. 3



4
11

FIG. 4

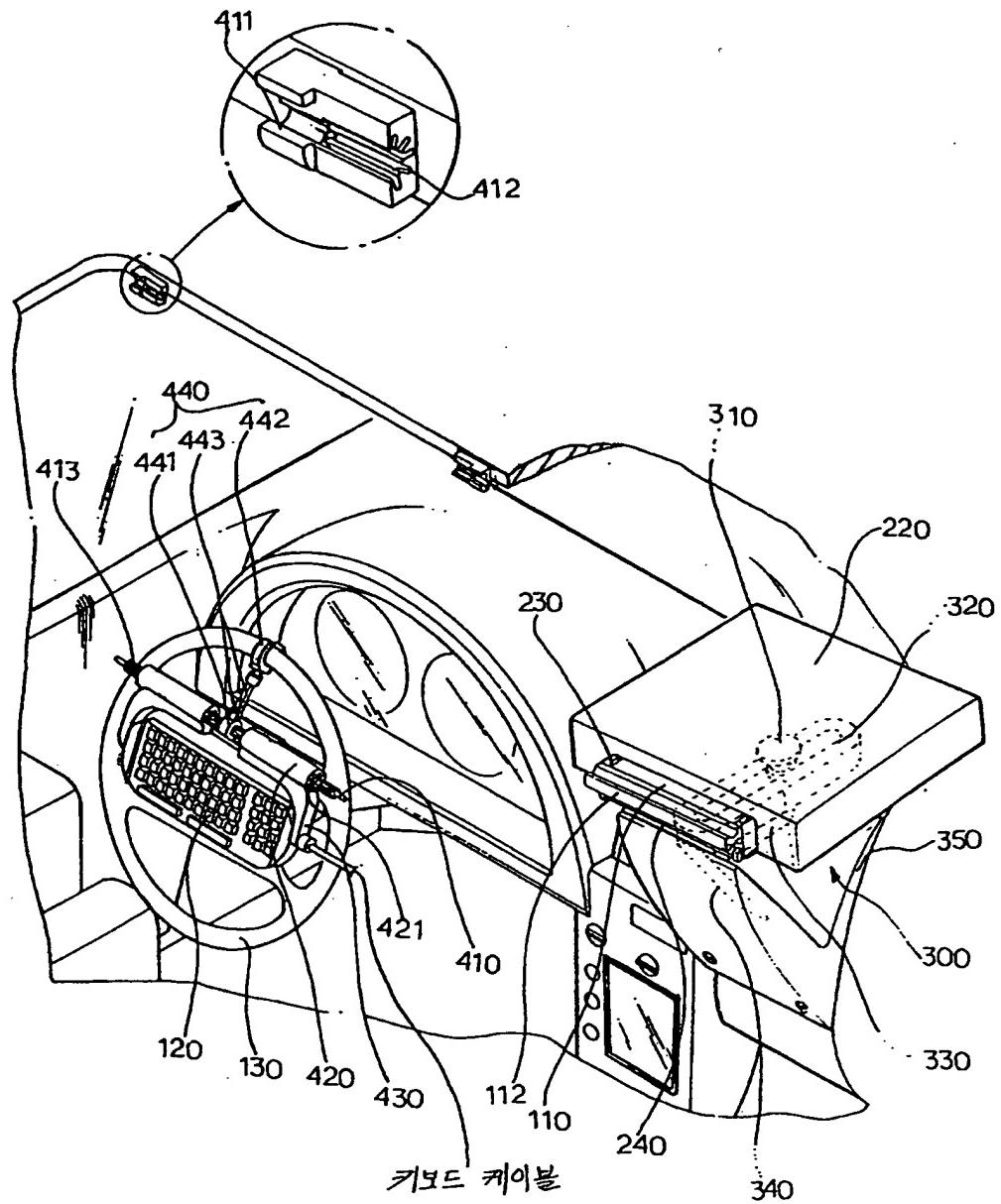
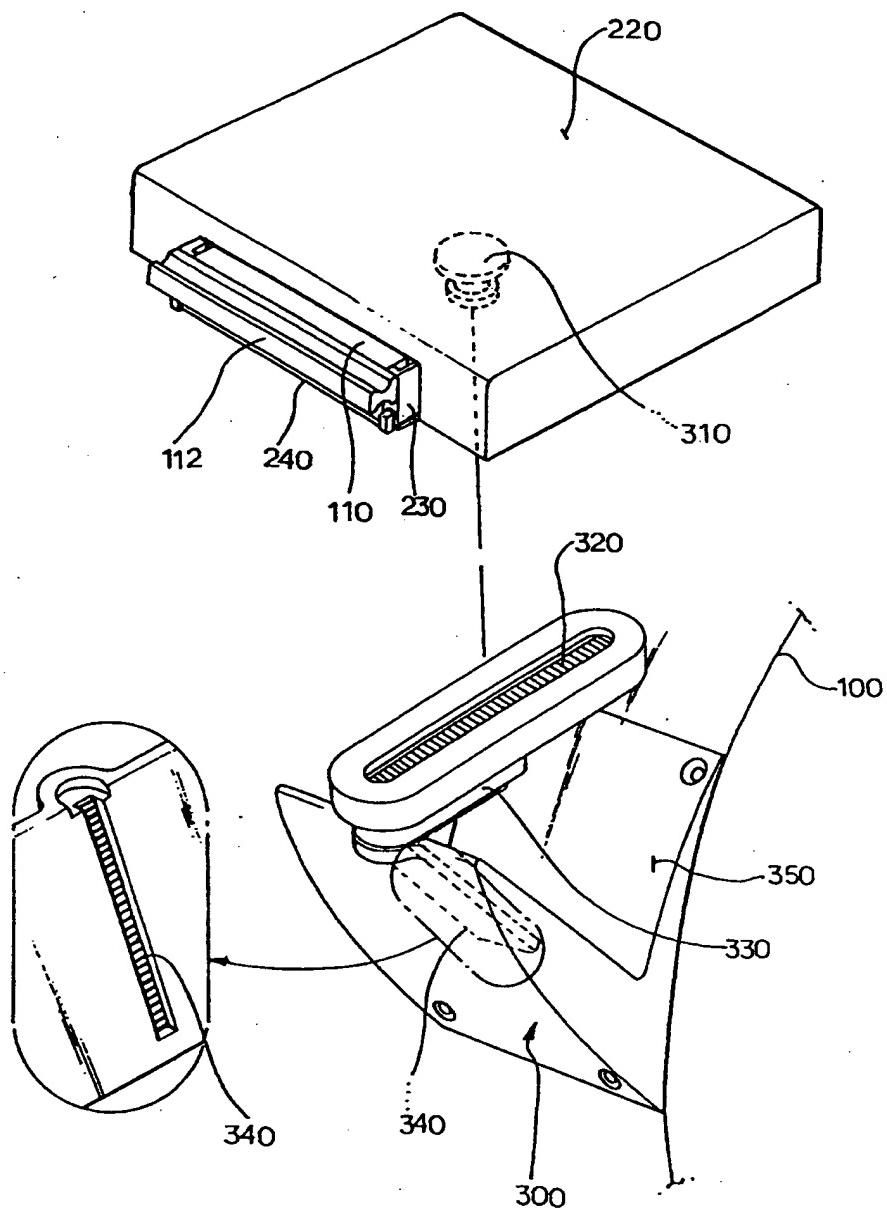
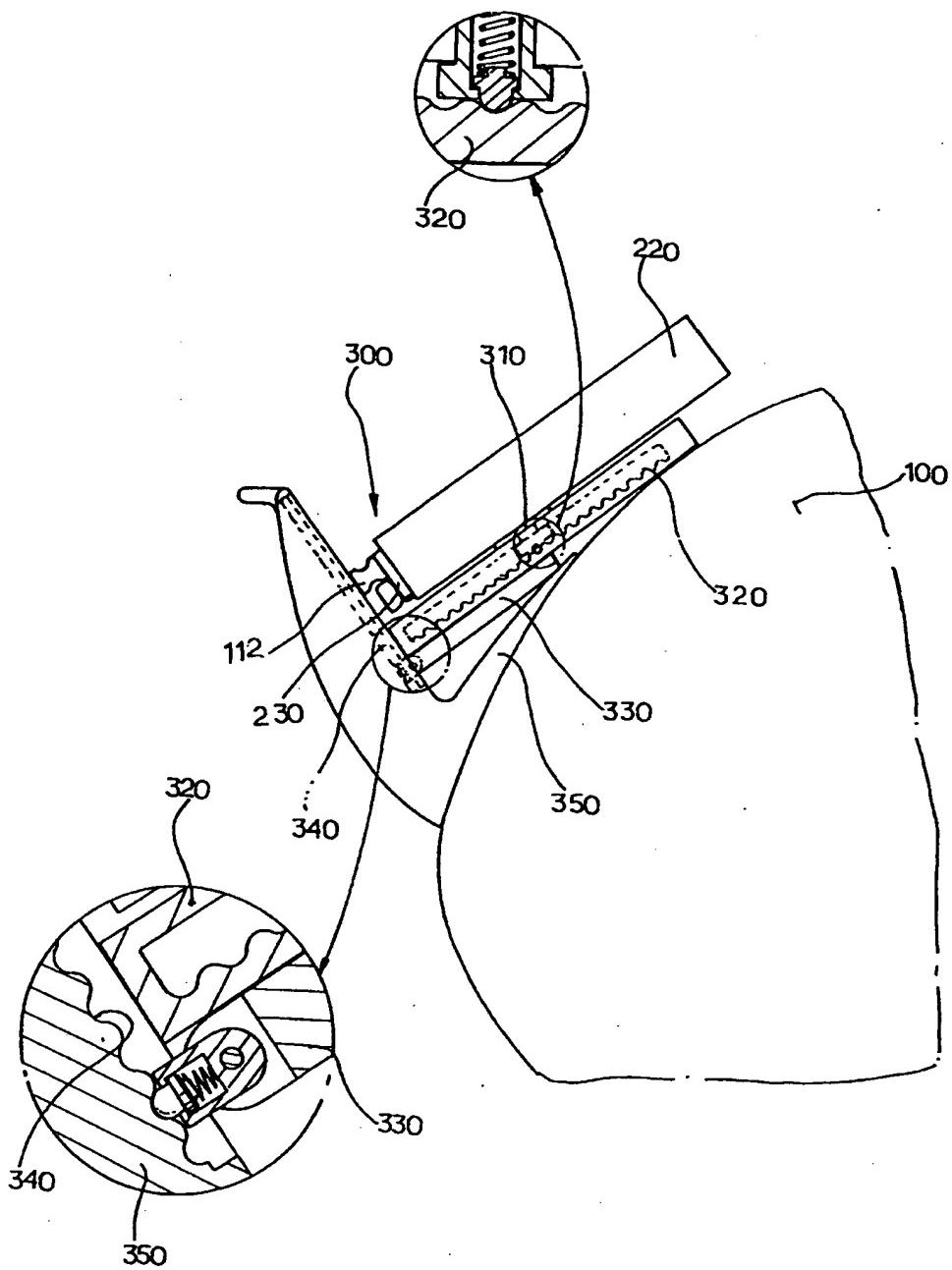


FIG. 5

5
11

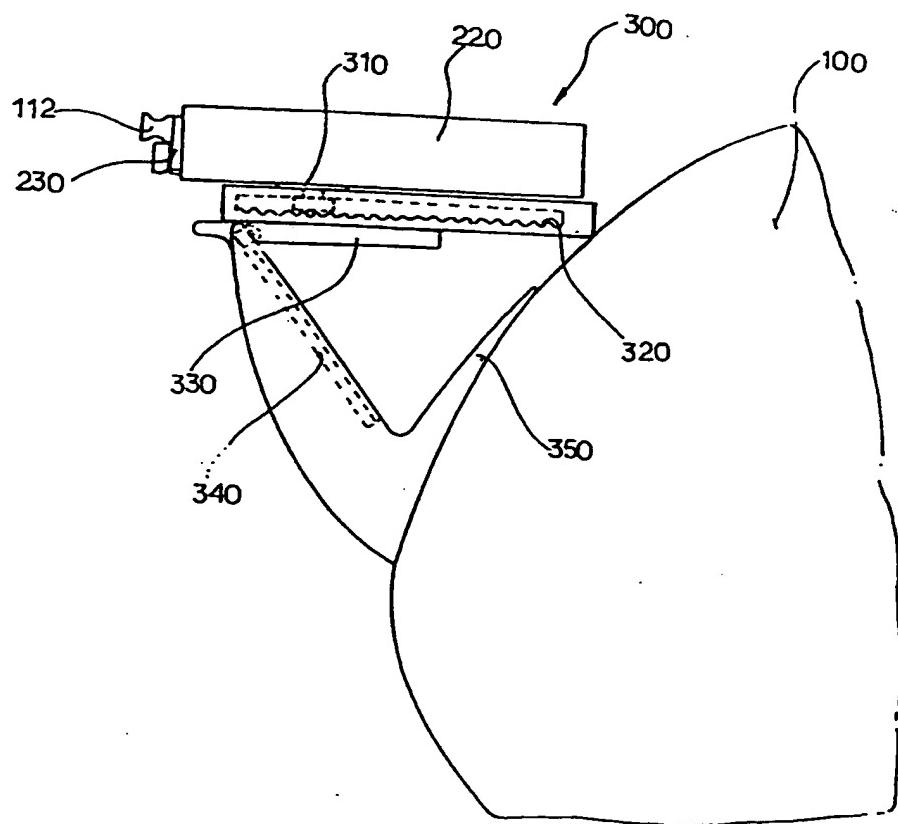
6

FIG. 6



7/11

FIG. 7



8/
11

FIG. 8

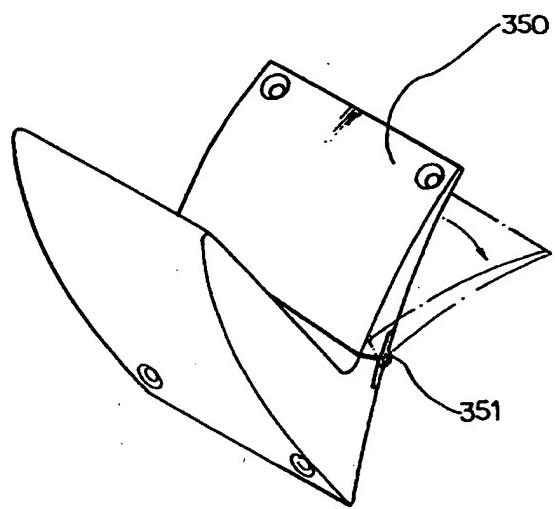
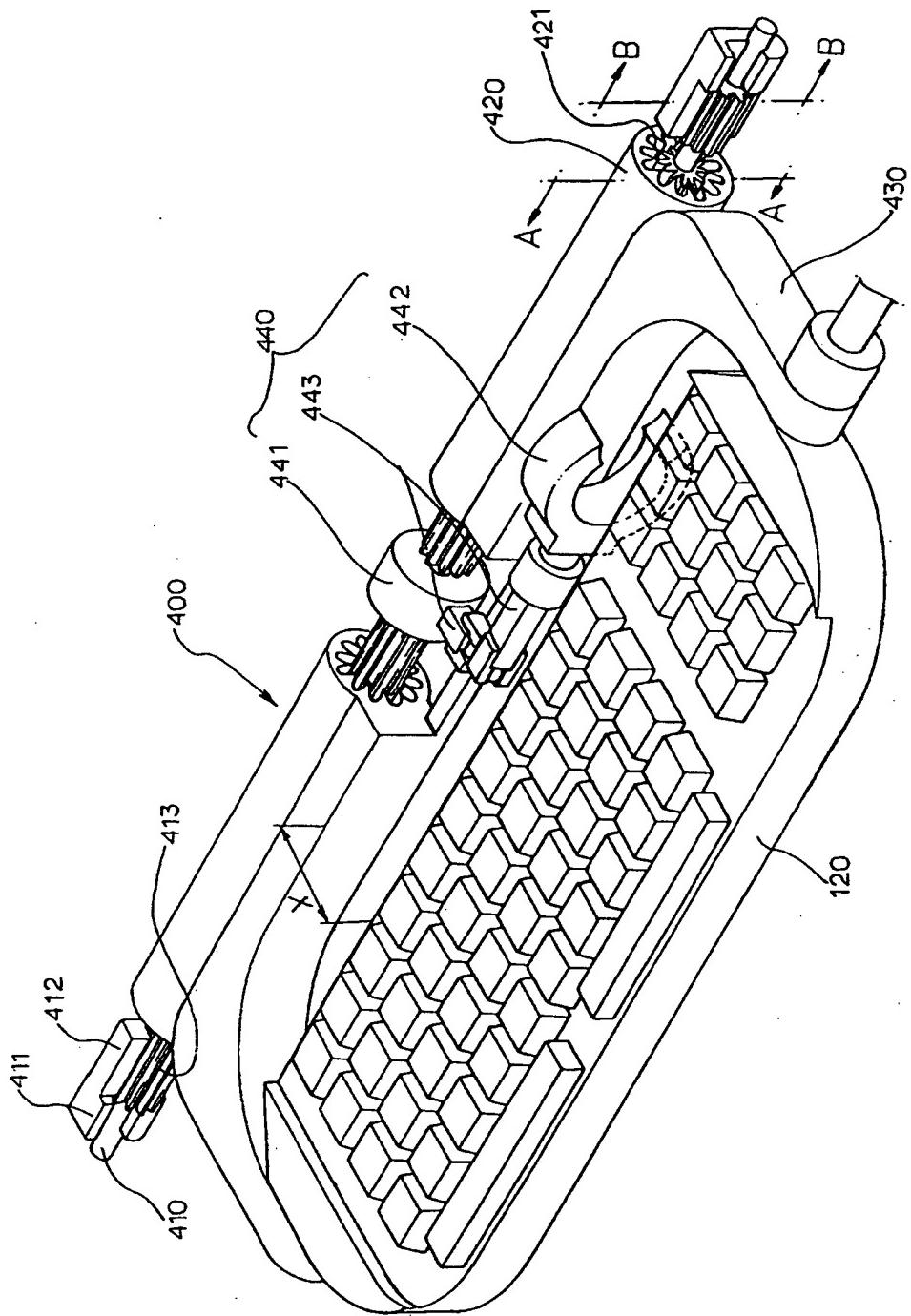


FIG. 9

9
11

10
/11

FIG. 10

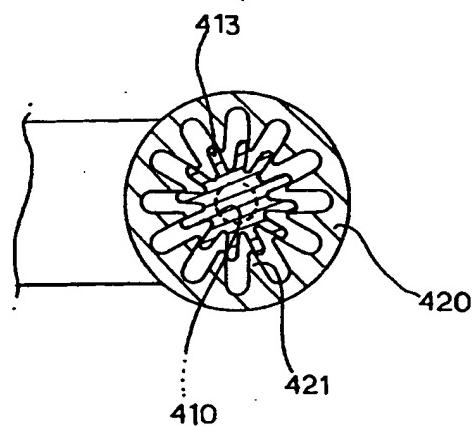


FIG. 11

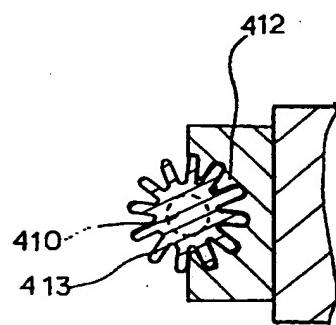


FIG. 12

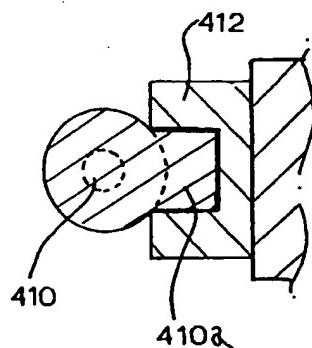


FIG. 13

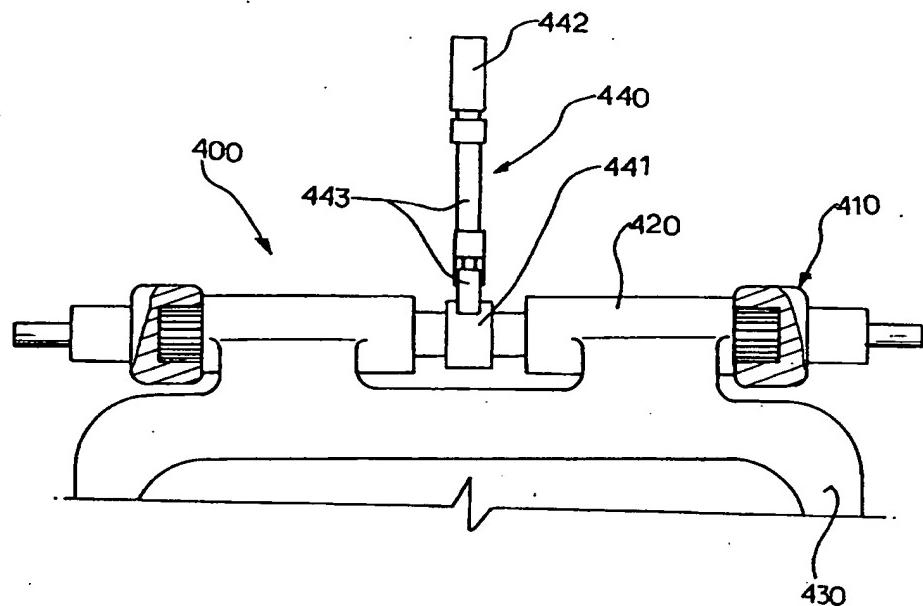
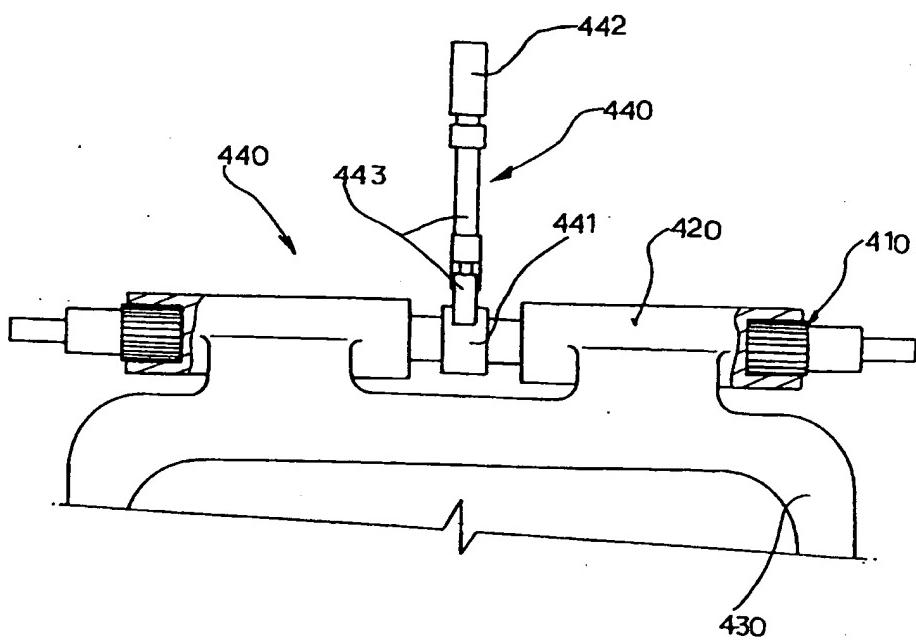


FIG. 14



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/00741

A. CLASSIFICATION OF SUBJECT MATTER		
IPC7 B60R 27/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 B60R		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 41 16 758A1(BAYERISHE MOTOREN WERKE A. G) 26.NOVEMBER 1992 SEE THE WHOLE DOCUMENT	1 - 8
A	JP 10-332390A(SONY) 18. DECEMBER.1998 ABSTRACT ; FIGURES 1, 4	1 - 3
A	DE 42 28605A1(BLAUPUNKT-WERKE GmbH) 3. MARCH 1994 SEE THE WHOLE DOCUMENT	1 - 3
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
Date of the actual completion of the international search	Date of mailing of the international search report	
06 DECEMBER 2000 (06.12.2000)	08 DECEMBER 2000 (08.12.2000)	
Name and mailing address of the ISA/KR Korean Industrial Property Office Government Complex-Taejon, Dunsan-dong, So-ku, Taejon Metropolitan City 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  LEE, Sung Cheol Telephone No. 82-42-481-5412	